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| 10/050,866 | 01/18/2002 | Kiyoshi Yoshizumi | 218209US3 | 9246 |
| 22850 | 7590 | 12/06/2007 | | |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | | |
| | | | EXAMINER HODGE, ROBERT W | |
| | | | ART UNIT 1795 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/050,866

Applicant(s)

YOSHIZUMI ET AL.

Examiner

Robert Hodge

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 8-18, 20, 32-41 and 46-49 is/are pending in the application.
- 4a) Of the above claim(s) 2-4, 9, 10, 16-18, 20, 32-36, 40, 41 and 46-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 8, 11-15 and 37-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/27/07.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 10/18/07 have been fully considered but they are not persuasive. First and foremost applicants have amended claim 12 without the proper status identifier or showing the amendment by underlining the added limitations to the claim. The claim has been amended back to the state in which it was filed back with the claims filed on 6/27/06. In order to advance prosecution the Examiner is not sending out a notice of non-compliant amendment but is making applicants aware of this error and said amendment will be treated as such.

In response to applicant's argument that the fuel cell of Boneberg has a different intended use than the instant invention, the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case applicants arguments are not commensurate in scope with the claims because no intended use is recited in the claims and secondly the prior art is in fact capable of performing the argued intended use of the instant invention as has already been addressed in previous arguments, therefore even if the claims were amended to include intended use the prior art would still read on the claims as recited. Therefore the rejections will be maintained.

With regards to claim 13, applicants state that the only structure corresponding to the "means for opening and closing the valve at intervals" can be a "timer". However as

Art Unit: 1795

has already been clarified means plus function language allows for equivalents thereof. If applicants want claim 13 to read only on a timer than applicants must recite this limitation in the claim. Therefore the PLC controller of WO '993 still meets the requirements of 35 U.S.C. 112 6th paragraph as being an equivalent thereof and therefore the rejection will be maintained. It is noted that applicants should be well aware of the structure of PLC controllers and the functionality of said devices. The device itself contains a timer, this timer is used to determine at what intervals the program contained within the controller will perform the function based on said program.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 12 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a discharged oxygen-off gas passage (otherwise known as the second flow passage), does not reasonably provide enablement for "the valve" (as defined in claim 1) that is disposed in the hydrogen-off gas passage (otherwise known as the first flow passage) which is used to control the flow rate of the pressure changing portion in the oxidant inlet stream (otherwise known as the seventh flow passage). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The Examiner notes that there is only one

valve defined in claim 1 and that valve corresponds to valve 104 in the elected species of figure 6. Claim 12 depends on claim 1 and states that "the valve" (which has to be valve 104 disposed in the first passage) is controlled by the control portion to increase the flow rate of the discharged oxygen-off gas (the second flow passage) by means of a flow rate-changing portion (which can only be located in the seventh flow passage according to the elected species of figure 6). So as recited in claim 12 applicants are claiming that the valve that is used to control the hydrogen-off gas is also used to control the flow rate of the oxygen-off gas by means of the compressor located in the oxygen inlet passage. Said scenario is impossible, a valve that is located in the hydrogen-off gas passage cannot be used to control the oxygen off-gas passage which is entirely separate from the hydrogen-off gas passage by means of the pressure changing device located in the oxygen inlet passage which is entirely separate from the hydrogen-off gas passage and oxygen-off gas passage. Therefore as long as the prior art teaches any sort of pressure changing device (pump, blower, compressor, etc...) in the oxygen inlet passage it will read on the claims as so recited.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by GB 2242563 (provided by applicants in the IDS submitted 7/27/07 with the statement stating that the UK publication is the readily available English translation of the cited non-English language reference which is DE 3537527) hereinafter referred to as Citation 6.

According to the provided English translation of the German office action:

4. Lack of novelty of claim 1 (§ 21 (1) No. 4 German Patent Act in connection with § 3 German Patent Act)

As regard the structuring of the features it is referred to paragraph 1 of the present submission.

Citation 6 discloses:

- 1.1. a fuel cell system (summary),
- 1.2. installed onboard of a vehicle (summary: submarine)
- 1.3. and having a hydrogen fuel cell releasing hydrogen-off gas and oxygen-off gas (summary).
- 1.4. The fuel cell system according to citation 6 further exhibits a first flow passage which leads from a hydrogen-off gas exhaust port of the fuel cell and through which the discharged hydrogen-off gas flows (passage (51) in fig. 2),
- 1.5. and a second flow passage which leads from an oxygen-off gas exhaust port of the fuel cell and through which the discharged oxygen-off gas flows (passages (52, 55) in fig. 2).
- 1.6. Further, a mixing portion is provided, which introduces and mixes the discharged hydrogen-off gas from the first passage and the discharged oxygen-off gas from the second flow passage, (combination site of the passages (51) and (58) between the valves (73) in fig. 3).
- 1.7. Further, a third flow passage is provided, which leads from the mixing portion and passing to the atmosphere by the mixing gas (passages

between the combination site of passage (51) and (58) between the valves (73) and (including) valve (79) in fig. 3).

- 1.8. A valve is disposed in the first flow passage (valve (73) in passage (51) in fig. 3),
- 1.9. being an open/close valve (holding valve (73), column 11, line 35).

Thus, citation 6 discloses all features of claim 1. Therefore, claim 1 is not new.

In the above citations column 11, line 35 corresponds to page 17, line 6 of the GB reference, the rest of the citations are correctly identified. Therefore as stated above Citation 6 anticipates claim 1.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 8 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/63993 hereinafter Joerissen et al. in view of U.S. Patent No. 6,696,188 hereinafter Boneberg et al.

Through the provided translation of WO 00/63993 Joerissen et al. teaches a fuel cell unit 7 that utilizes a metal hydride hydrogen storage device 19 to provide hydrogen to the anode chamber 2 by means of a passage provided with a pressure reduction valve 24. The anode chamber outlet of the fuel cell provides a passage for unreacted hydrogen to be recycled to the anode chamber inlet by means of a pump 9 or exhausted to the atmosphere via a further passage with a valve 7, each of the exhaust

passages for discharging anode and cathode off-gas are provided with condensed water separators 8a and 8b, wherein water separator 8a (i.e. flow-rate reducing portion) inherently reduces the flow rate of the exiting anode exhaust and also includes an inherent buffer (i.e. storage of water and an area where the water is separated from the gas). Joerissen et al. also teaches a Programmable Logic Controller 14 that controls the valves and pumps of the system based on input received from the entire system such as cell voltage and temperature which then controls all of the fluid flow streams based on said input by either operating pumps and/or valves that are opened and closed at regular intervals and also according to other factors such as concentration which can be determined indirectly from at least cell voltage. Joerissen et al. further teaches a pump 11 (i.e. pressure changing device) in the oxidant inlet stream for the fuel cell to provide oxidant to the fuel cell (see the whole translation of Joerissen, now provided). The Examiner notes that applicants have elected the species of figure 6 and there is only support for a pressure changing device in the seventh flow passage, which is known as the oxidant inlet stream, there is no support in figure 6 for a pressure changing device in the second flow passage, which is known as the oxygen-off gas stream and therefore the limitation of "a flow rate-changing device which is disposed in the second flow passage" has been withdrawn from consideration from claims 11 and 12.

Joerissen does not teach a mixing portion that mixes the anode and cathode exhaust gases.

Boneberg et al. teaches a fuel cell system being supplied with hydrogen and oxygen gases, which in turn generates electric power (column 3, lines 10-15) then mixing the exhaust gas streams from a fuel cell (figure 1 and column 5, lines 1-3) and combusting the mixture catalytically (column 2, line 15 and column 4, line 2) and then venting the combustion product to the atmosphere thus having a reduced hydrogen content (figure 1 and column 5, line 3).

At the time of the invention it would have been obvious to one having ordinary skill in the art to include a mixing portion at the anode and cathode exhaust ports of Joerissen as taught by Boneberg in order to provide a spent gas mixture that could be catalytically combusted to fully utilize the reactant gases for heating the system as needed and therefore not wasting any reactant gases by venting them to the atmosphere.

Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joerissen et al. in view of Boneberg et al. as applied to claim 14 above, and further in view of U.S. Patent No. 2,850,038 hereinafter Shabaker.

Joerissen et al. as modified by Boneberg et al. does not teach any properties of the flow-rate reducing portion.

Shabaker teaches a flow control device for gaseous material employing variable diameter orifices that can in particular be smaller or larger depending on the control conditions (column 1, lines 15-21 and column 4, lines 3-60).

Joerissen et al. as modified by Boneberg et al. and Shabaker are analogous art because they are from similar problem solving area of controlling the flow of gases.

At the time of the invention it would have been obvious to one having ordinary skill in the art to include different diameter orifices as well as changing the volume of the flow rate reducing device (i.e. water separator) of Joerissen et al. as taught by Shabaker in order to properly remove all of the water from the anode exhaust so that it can be reused for humidification and cooling thereby optimally operating the system, because for example if the flow is too fast not enough water will be removed for reuse in the system and if the flow is too slow the system would get backed up and potentially flood the anode chamber thus rendering the fuel cell useless.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 7/27/07 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Hodge whose telephone number is (571) 272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RWH


JONATHAN CREPEAU
PRIMARY EXAMINER